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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/688,525	10/16/2000	Clifford A. Henricksen	02103-393001	3066

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EXAMINER	
MICHALSKI, JUSTIN I	

ART UNIT	PAPER NUMBER
2644	

DATE MAILED: 12/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/688,525	HENRICKSEN ET AL.	
	Examiner	Art Unit	
	Justin Michalski	2644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 August 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *2-18,21 and 22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *2-18,21 and 22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 2-20 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 2-9, 11-18, 21, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ferren (US Patent 5,802,190) in view of Edgar (US Patent 5,588,063).

Regarding Claim 2, Ferren discloses a loudspeaker system, comprising: a first loudspeaker array comprising an enclosure having a width and a height and at least six acoustic drivers having radiating surfaces (Ferren discloses an embodiment with more than 6 speakers) (Figure 2; Column 5, lines 35-37), wherein drivers are positioned in the enclosure in a first substantially straight line, substantially regularly spaced so that the edges of radiating surfaces are less than two inches apart (Ferren discloses separation being ½ inch) (Column 5, lines 37-39) , and array is constructed and arranged to radiate sound in a predetermined frequency range (Ferren discloses the full frequency range being coupled) (Column 2, lines 10-13). Ferren does not disclose the drivers having a

diameter less than three inches or a predetermined frequency range of at least six octaves.

It is well known in the art that the frequency response of the human ear is approximately 20Hz to 20KHz which is approximately 10 octaves. To produce the highest quality audio response to the ear, one skilled in the art would have known that the transducers should produce a frequency range output encompassing the greatest range between 20Hz to 20KHz possible. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made that a loudspeaker array would have a frequency range of at least six octaves in order to produce a high quality perceived sound for the listener.

Edgar also discloses a speaker (Fig. 5A) comprising at least six drivers in a linear array. Edgar further discloses an array of ten one-inch speakers may be used in a cabinet of 11 inches (Col. 6, lines 22-33) which will inherently produce spacing less than two inches apart. Edgar further discloses there are several reasons why a small speaker size is advantageous including producing better phase linearity and smoother frequency response (Col. 4, lines 21-37). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use speakers less than three inches in diameter to produce better phase linearity and smoother frequency response as taught by Edgar.

Regarding claim 8, Ferren further discloses an electrical circuit which provides essentially the same audio signal to all of said acoustical drivers at all frequencies

(Ferren discloses circuit in Figure 11 which discloses substantially the same audio signal to all of the drivers (26).

Regarding Claim 9, Ferren further discloses the diameter (i.e. width) of the speaker enclosure is six inches (Column 4, lines 6-7) and the speakers can be disposed within a height eight feet (Column 4, lines 15-18) producing a height to width ratio of (8 feet*12inches)/6inches = 16 which is greater than 11.

Regarding Claim 21, Ferren further discloses a plurality of first loudspeaker arrays in a room (Ferren discloses auditorium) (Column 1, line 13) having a performance area contiguous with a listening area (Figure 1), said plurality of loudspeaker arrays (arrays 10, 12, 14, and 16) located at a corresponding plurality of spaced locations in said performance are each facing said listening area (area 18) with the associated straight line substantially vertically oriented, and a corresponding plurality of electroacoustical transducers (Ferren discloses announcer's microphone, Column 1, line 55) located in said performance area at a corresponding plurality of spaced locations electrically coupled to respective ones of said loudspeaker arrays and located between the associated loudspeaker array and said listening area (Ferren discloses announcer in vicinity of the loudspeakers (i.e. between loudspeaker array and listening area) (Column 1, lines 51-55).

Regarding Claim 22, Ferren further discloses a room having a performance area (Figure 1) contiguous with a listening area (area 18) and a plurality of loudspeakers (arrays 10, 120,14, and 16) with corresponding electroacoustical transducers including, placing said plurality of loudspeaker arrays at a corresponding plurality of spaced

locations in said performance are with each facing said listening area (18) with the associated straight line substantially vertically oriented, placing said plurality of electroacoustical transducers in said performance area at a corresponding plurality of spaced locations between an associated loudspeaker array and said listening area, and electrically coupling each of said electroacoustical transducers to an associated loudspeaker array (Ferren discloses announcer with microphone (i.e. electrical transducer) in vicinity of loudspeaker (i.e. between loudspeaker and listening area) (Column 1, lines 51-55) which outputs sound from the microphone.

Regarding Claim 3, Ferren discloses a loudspeaker system, comprising: a first loudspeaker array comprising an enclosure having a width and a height and at least six acoustic drivers having radiating surfaces (Ferren discloses an embodiment with more than 6 speakers) (Figure 2; Column 5, lines 35-37), wherein drivers are positioned in the enclosure in a first substantially straight line, substantially regularly spaced so that the edges of radiating surfaces are less than two inches apart (Ferren discloses separation being ½ inch) (Column 5, lines 37-39), and array is constructed and arranged to radiate sound in a predetermined frequency range (Ferren discloses the full frequency range being coupled) (Column 2, lines 10-13), a second loudspeaker array having an enclosure and a plurality of acoustic drivers having radiating surfaces (Figure 7, array 80n), each of said drivers having an enclosure and a plurality of acoustic drivers having radiating surfaces (it is inherent acoustic drivers will have radiating surfaces), said drivers positioned in said enclosure in a second substantially straight line (Ferren discloses an embodiment with more than 6 speakers) (Figure 2; Column 5, lines 35-37),

regularly spaced less than one inch apart (Ferren discloses separation being ½ inch) (Column 5, lines 37-39), wherein the second loudspeaker array in constructed and arranged to be detachably secured to said first array in a manner that extends said first substantially straight line so that the height of said loudspeaker system is increased and so that the width of said loudspeaker system remains constant (Ferren discloses arrays are secured together by conventional fastener means (i.e. detachably secured), e.g. nuts and bolts (Figures 7 and 9). Ferren does not disclose the drivers having a diameter less than three inches.

Edgar also discloses a speaker (Fig. 5A) comprising at least six drivers in a linear array. Edgar further discloses an array of ten one-inch speakers may be used in a cabinet of 11 inches (Col. 6, lines 22-33) which will inherently produce spacing less than two inches apart. Edgar further discloses there are several reasons why a small speaker size is advantageous including producing better phase linearity and smoother frequency response (Col. 4, lines 21-37). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use speakers less than three inches in diameter to produce better phase linearity and smoother frequency response as taught by Edgar.

Regarding Claim 4, Ferren further discloses a loudspeaker system comprising plurality of arrays (Figure 7) with a diameter of 6 inches (Column 4, lines 6-7). Ferren further discloses each array is about 12 feet high (Column 4, lines 63-64) which produces a height to width ratio of (12 feet*12 inches)/6 inches = 24 which is greater than 20.

Regarding claim 5, Ferren further discloses an attachment device (nuts and bolts; Column 6, lines 25-28) for attaching said first loudspeaker array to said second loudspeaker array.

Regarding Claim 6, Ferren further discloses an electrical circuit which provides essentially the same audio signal to all of said acoustical drivers at all frequencies (Ferren discloses circuit in Figure 11 which discloses substantially the same audio signal to all of the drivers (26).

Regarding Claim 7, Ferren further discloses the individual arrays may be secured together by fastener means (i.e. may be removed and portable) (Column 6, lines 24-28)

Regarding Claim 11, Ferren discloses a first portable array module comprising a portable enclosure and at least six acoustic drivers positioned in said enclosure in a substantially straight line (Ferren discloses an embodiment with more than 6 speakers) (Figure 2; Column 5, lines 35-37); a second portable array comprising a second portable enclosure and a plurality of acoustic drivers positioned in a substantially straight line; and an attachment system for attaching said first portable array to said second portable array in a manner so as to extend said substantially straight line (Ferren discloses individual linear arrays 80a, 80b...80n in Figure 7 where arrays may be secured together by conventional fastener means (Column 6, lines 21-28).

Regarding Claim 12, Ferren discloses a loudspeaker array module (Figure 2), comprising: a portable enclosure having an attachment system for attaching said module to a second like module (Figure 7; Column 6, lines 21-28); and at least six acoustic drivers (Ferren discloses an embodiment with more than 6 speakers) (Figure 2;

Column 5, lines 35-37), each of said acoustic drivers having radiating surface (It is inherent that acoustic drivers will have a radiating surface), said at least six drivers positioned in said enclosure in a substantially straight line (Figure 2), regularly spaced so that the edges of said radiating surfaces are less than one inch apart (Ferren discloses separation being ½ inch) (Column 5, lines 37-39); whereby when said module is attached to said second like module all said drivers are positioned in said substantially straight line (Figure 7). Ferren does not disclose the drivers having a diameter less than three inches or a predetermined frequency range of at least six octaves.

It is well known in the art that the frequency response of the human ear is approximately 20Hz to 20KHz which is approximately 10 octaves. To produce the highest quality audio response to the ear, one skilled in the art would have known that the transducers should produce a frequency range output encompassing the greatest range between 20Hz to 20KHz possible. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made that a loudspeaker array would have a frequency range of at least six octaves in order to produce a high quality perceived sound for the listener.

Edgar also discloses a speaker (Fig. 5A) comprising at least six drivers in a linear array. Edgar further discloses an array of ten one-inch speakers may be used in a cabinet of 11 inches (Col. 6, lines 22-33) which will inherently produce spacing less than two inches apart. Edgar further discloses there are several reasons why a small speaker size is advantageous including producing better phase linearity and smoother

frequency response (Col. 4, lines 21-37). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use speakers less than three inches in diameter to produce better phase linearity and smoother frequency response as taught by Edgar.

Regarding Claim 13, Ferren discloses a method for improving the number of electrical watts transduced per unit radiating area of a line array loudspeaker comprising: mounting in a substantially straight line a plurality of acoustic drivers having a radiating surface having an edge (Figure 2); and placing said acoustic drivers in said line so that the edges of radiating surfaces of adjacent acoustic drivers are separated by no greater than one inch (Ferren discloses separation being ½ inch) (Column 5, lines 37-39). Ferren does not disclose the drivers having a diameter less than three inches or a predetermined frequency range of at least six octaves.

It is well known in the art that the frequency response of the human ear is approximately 20Hz to 20KHz which is approximately 10 octaves. To produce the highest quality audio response to the ear, one skilled in the art would have known that the transducers should produce a frequency range output encompassing the greatest range between 20Hz to 20KHz possible. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made that a loudspeaker array would have a frequency range of at least six octaves in order to produce a high quality perceived sound for the listener.

Edgar also discloses a speaker (Fig. 5A) comprising at least six drivers in a linear array. Edgar further discloses an array of ten one-inch speakers may be used in a

cabinet of 11 inches (Col. 6, lines 22-33) which will inherently produce spacing less than two inches apart. Edgar further discloses there are several reasons why a small speaker size is advantageous including producing better phase linearity and smoother frequency response (Col. 4, lines 21-37). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use speakers less than three inches in diameter to produce better phase linearity and smoother frequency response as taught by Edgar.

Regarding Claim 14, Ferren discloses a loudspeaker system for a live source of sound comprising (Figure 1 discloses use as a public address system): a line array loudspeaker comprising a line array plurality of acoustic drivers (Figure 2), each of the acoustic drivers positioned in an enclosure in a straight line regularly spaced less than 1 inch apart (Ferren discloses spacing between adjacent speakers being ½ inch) (Column 5, lines 32-52) the line array being constructed and arranged to be placed in the near vicinity of the live source of sound facing an audience (Ferren discloses announcer in vicinity of loudspeakers used in public address system such as in Figure 1) (Column 1, lines 53-54). Ferren does not disclose the drivers having a diameter less than three inches or a predetermined frequency range of at least six octaves.

It is well known in the art that the frequency response of the human ear is approximately 20Hz to 20KHz which is approximately 10 octaves. To produce the highest quality audio response to the ear, one skilled in the art would have known that the transducers should produce a frequency range output encompassing the greatest range between 20Hz to 20KHz possible. Therefore, it would have been obvious to one

of ordinary skill in the art at the time the invention was made that a loudspeaker array would have a frequency range of at least six octaves in order to produce a high quality perceived sound for the listener.

Edgar also discloses a speaker (Fig. 5A) comprising at least six drivers in a linear array. Edgar further discloses an array of ten one-inch speakers may be used in a cabinet of 11 inches (Col. 6, lines 22-33) which will inherently produce spacing less than two inches apart. Edgar further discloses there are several reasons why a small speaker size is advantageous including producing better phase linearity and smoother frequency response (Col. 4, lines 21-37). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use speakers less than three inches in diameter to produce better phase linearity and smoother frequency response as taught by Edgar.

Regarding Claim 15, it is well known in the art that loudspeakers are commonly used to output a wide range of audio signal content including vocalist musical performers. Ferren further discloses a sound delivery system to be used as a public address system in numerous places and situations and/or playing background music or the like which could include vocalist musical performer and presenting entity (Column 1, lines 9-12).

Regarding Claim 16, Ferren further discloses a sound delivery system to be used as a public address system in numerous places and situations and/or playing background music or the like which could include a plurality of performers (Column 1, lines 9-12) (It is also well known in the art that loudspeakers are commonly used to

output a wide range of audio signal content including a plurality of performers), loudspeaker system comprising a plurality of line arrays (Figure 1; references 10, 12, 14, and 16), line arrays having a plurality of acoustic drivers (Figure 2), plurality of drivers positioned in enclosure in a straight line regularly spaced less than one inch apart (Ferren discloses spacing adjacent speakers as ½ inch) (Column 5, lines 37-39), each line array being constructed and arranged to be placed in the vicinity of one of said plurality of performers (Ferren discloses announcer in vicinity of loudspeaker) (Column 1, lines 53-55). Ferren does not disclose the drivers having a diameter less than three inches.

Edgar also discloses a speaker (Fig. 5A) comprising at least six drivers in a linear array. Edgar further discloses an array of ten one-inch speakers may be used in a cabinet of 11 inches (Col. 6, lines 22-33) which will inherently produce spacing less than two inches apart. Edgar further discloses there are several reasons why a small speaker size is advantageous including producing better phase linearity and smoother frequency response (Col. 4, lines 21-37). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use speakers less than three inches in diameter to produce better phase linearity and smoother frequency response as taught by Edgar.

Regarding Claim 17, as stated above apropos of claim 14 Ferren as modified makes obvious all elements of that claim. Ferren further discloses the live source as an announcer (i.e. orator) (Column 1, lines 53-57). It is also well known in the art that

loudspeakers are commonly used to output a wide range of audio signal content including orators.

Regarding Claim 18, Ferren further discloses an announcer (i.e. live source) walks back and forth in front of his or her audience at time approaching any one of the arrays (i.e. announcer is between arrays and audience) (Column 3, lines 19-23).

4. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ferren in view of Edgar as applied to claim 2 above in further view of Humphrey (US Patent 4,797,633). Ferren/Edgar discloses a loudspeakers system as stated apropos of claim 2 above including power amplifiers (Ferren, Figure 6; amplifiers 62L, 64L, 62R, and 63R). Ferren does not disclose transducing at least seven watts of electrical energy per square inch of radiating surface. Edgar further discloses that the total acoustic power available from the system is proportional to the square of the total speaker surface area and it is desirable to fit as many speakers into the line as will fit. Ten one-inch speakers as stated in the rejection of claim 2 will produce a total radiating surface area of approximately (10 speakers x (0.5 inch radius)^2 x 3.14) = 7.85 square inches. Humphery discloses a commonly designed amplifier rated at 100 watts per channel which will produce (100 Watts / 7.85 inches^2) = approximately 12.7 Watts/in^2 which is greater than 7 watts/in^2. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made for a common amplifier to produce at least 7 watts of electrical energy per square inch of radiating surface.

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Justin Michalski whose telephone number is (703)305-5598. The examiner can normally be reached on 8 Hours, 5 day/week.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bill Isen can be reached on (703)305-4386. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JIM

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PRIMARY EXAMINER